

CLAIMS

What is claimed is:

1. A method of determining a characteristic of a conductive film, comprising the acts of:
 - providing a disturbance at a surface of the film;
 - directing a light beam onto the film so as to generate electron density waves in the film;
 - detecting an intensity of the light beam reflected from the film; and
 - determining the characteristic of the film from the detected intensity as a function of the reflectance angle.
2. The method of Claim 1, wherein a thickness of the film is less than about 300 nm.
3. The method of Claim 1, wherein a thickness of the film is less than about 100 nm.
4. The method of Claim 1, wherein the film is of metal and a thickness of the film is about a skin depth of the metal.
5. The method of Claim 1, wherein the disturbance is provided by directing a beam of energy onto the film.
6. The method of Claim 1, wherein the disturbance as provided by directing a pulse of coherent light onto the film.
7. The method of Claim 1, wherein the film comprises a metal.

8. The method of Claim 5, wherein a diameter of the probe beam at the surface of the film is greater than the diameter of the excitation beam at the surface of the film.

9. The method of Claim 1, wherein the act of determining comprises determining a resonance angle of the light beam associated with a change in the detected intensity of the light beam as a function of angle.

10. The method of Claim 1, wherein the characteristic of the film is its thickness.

11. The method of Claim 1, further comprising the act of:
polarizing the light beam prior to its reflection from the film.

12. The method of Claim 1, wherein the disturbance is a surface acoustic wave.

13. The method of Claim 1, wherein the disturbance is such as to allow the generation of the electron density waves by the light beam from a far-field.

14. Apparatus for determining a characteristic of a conductive film, comprising:
a support for the conductive film;
a source of energy arranged to direct the energy onto the film on the support, thereby to provide a disturbance in the film;
a source of a light beam arranged to direct the light beam onto the film to generate electron density waves in the film; and
a detector arranged to receive light from the light beam reflected from the film at different angles, thereby to determine the characteristic of the film from the reflected intensity of the light as a function of angle.

15. The apparatus of Claim 14, wherein the source of energy and the source of the light beam are both lasers.

16. The apparatus of Claim 14, further comprising a polarizer located to polarize the light beam.

17. The apparatus of Claim 14, wherein the detector includes a CCD camera.